LISTING OF CLAIMS

1. (Original) A method of fabricating a memory cell, comprising:

forming a first conductive layer over a substrate;

forming a superionic conductor over said first conductive layer;

forming a polymer layer over said superionic conductor in a manner which produces a layer of mobile ions between said polymer layer and said superionic conductor; and

forming a second conductive layer over said polymer layer.

2. (Original) The method of claim 1, wherein said superionic conductor is formed from a transition metal complex.

3. (Original) The method of claim 1, wherein said superionic conductor is selected from a group consisting of CuBr and Cu_2Se.

4. (Original) The method of claim 1, wherein said polymer layer is formed from vinyl monomers.

5. (Original) The method of claim 5, wherein said vinyl monomers are selected from a group consisting of methacrylates, acrylates, styrenes, vinylpyridines, acrylonitrile, and acrylamides.

6. (Original) The method of claim 1, wherein forming the polymer layer comprises placing monomers in contact with said superionic conductive layer such that said superionic conductor acts as an initiator to form polymers from said monomers.

7. (Original) The method of claim 1, wherein said layer of mobile ions is derived from said superionic conductor.

8. (Original) The method of claim 1, wherein said first conductor and said second conductor are each formed of a conductor selected from the group consisting of tungsten, nickel, platinum, copper, and gold.

9. (Original) A method of forming a memory cell, comprising:

forming an opening in an insulating layer to expose a portion of an underlying first conductive layer;

forming a superionic conductor over said first conductive layer in said opening;

forming a polymer layer over said superionic conductor in a manner which produces a layer of mobile ions between said polymer layer and said superionic conductor; and

forming a second conductor layer over said polymer layer.

10. (Original) The method of claim 9, wherein said superionic conductor is formed from a transition metal complex.

11. (Original) The method of claim 9, wherein said superionic conductor is formed from a group consisting of CuBr or Cu_2Se.

12. (Original) The method of claim 9, wherein the thickness of said superionic conductor is about 50% or less of the depth of said opening.

13. (Original) The method of claim 9, wherein said polymer layer is formed from vinyl monomers.

14. (Original) The method of claim 13, wherein said vinyl monomers are selected from a group consisting of methacrylates, acrylates, styrenes, vinylpyridines, acrylonitrile, and acrylamides.

15. (Original) The method of claim 9, wherein forming the polymer layer comprises placing monomers in contact with said superionic conductor such that said superionic conductor acts as an initiator to form polymers from said monomers.

16. (Original) The method of claim 15, wherein forming the polymer layer results in the formation of said layer of mobile ions.

17. (Original) The method of claim 9, wherein said first conductor and said second conductor are each formed of a group of conductors consisting of tungsten, nickel, platinum, copper, and gold.

18. (Original) A method of forming a memory cell, comprising:

forming an opening in an insulating layer to expose a portion of an underlying first conductive layer;

forming a superionic conductor over said first conductive layer in said opening;

forming a polymer layer over said superionic conductor in a manner which produces a layer of mobile ions between said polymer layer and said superionic conductor;

recessing said polymer layer within said opening such that a top layer of said polymer layer is substantially level with a top layer of said insulating layer; and

forming a second conductor layer over said polymer layer.

19. (Original) The method of claim 18, wherein said superionic conductor is formed from a transition metal complex.

20. (Original) The method of claim 18, wherein said superionic conductor is formed from a group consisting of CuBr or Cu_2Se.

21. (Original) The method of claim 18, wherein the thickness of said superionic conductor is about 50% or less of the depth of said opening.

22. (Original) The method of claim 18, wherein said polymer layer is formed from vinyl monomers.

23. (Original) The method of claim 18, wherein said vinyl monomers are selected from a group consisting of methacrylates, acrylates, styrenes, vinylpyridines, acrylonitrile, and acrylamides.

24. (Original) The method of claim 18, wherein forming the polymer layer comprises placing monomers in contact with said superionic conductor such that said superionic conductor acts as an initiator to form polymers from said monomers.

25. (Original) The method of claim 18, wherein said layer of mobile ions is derived from said superionic conductor.

26. (Original) The method of claim 18, wherein said first conductor and said second conductor are each formed of a group of conductors consisting of tungsten, nickel, platinum, copper, and gold.

27. (Original) A memory cell comprising:

a first conductive layer formed over a substrate;

a superionic conductor over said first conductive layer;

a polymer layer over said superionic conductor;

a layer of mobile ions derived from said superionic conductor and residing between said polymer layer and said superionic conductor; and

a second conductive layer over said polymer layer.

28. (Original) The memory cell of claim 27, wherein said superionic conductor is formed from a transition metal complex.

29. (Original) The memory cell of claim 27, wherein said superionic conductor is formed from a group consisting of CuBr and Cu_2Se.

30. (Original) The memory cell of claim 27, wherein said polymer layer is formed from vinyl monomers.

31. (Original) The memory cell of claim 30, wherein said vinyl monomers are formed from a group consisting of methacrylates, acrylates, styrenes, vinylpyridines, acrylonitrile, and acrylamides.

32. (Original) A molecular memory cell comprising:

a substrate having an opening in an insulator to expose a portion of an underlying first conductive layer;

a superionic conductor formed over the exposed portion of said first conductive layer;

a polymer layer over said superionic conductor;

a layer of mobile ions between said polymer layer and said superionic conductor; and

a second conductive layer over said polymer layer.

33. (Original) The memory cell of claim 32, wherein said superionic conductor is formed from the group consisting of CuBr and Cu_2Se.

34. (Original) The memory cell of claim 32, wherein said polymer layer is formed from vinyl monomers.

35. (Original) The memory cell of claim 34, wherein said vinyl monomers are selected from a group consisting of methacrylates, acrylates, styrenes, vinylpyridines, acrylonitrile, and acrylamides.

36. (Original) The memory cell of claim 32, wherein said layer of mobile ions is derived from said superionic conductor.

37. (Original) A molecular memory cell comprising:

a substrate having an opening in an insulating layer to expose a portion of an underlying first conductive layer;

a superionic conductor formed over the exposed portion of said first conductive layer;

a polymer layer over said superionic conductor and recessed within said opening such that a top layer of said polymer is substantially level with a top layer of said insulating layer;

a layer of mobile ions between said polymer layer and said superionic conductor; and

a second conductive layer over said polymer layer.

38. (Original) The memory cell of claim 37, wherein said superionic conductor is formed from the group consisting of CuBr and Cu_2Se.

39. (Original) The memory cell of claim 37, wherein said polymer layer is formed from vinyl monomers.

40. (Original) The memory cell of claim 39, wherein said vinyl monomers are selected from a group consisting of methacrylates, acrylates, styrenes, vinylpyridines, acrylonitrile, and acrylamides.

41. (Original) The memory cell of claim 37, wherein said layer of mobile ions is derived from said superionic conductor.

42. (Original) A memory system, comprising:

an array of memory devices, each memory device comprising:

a first conductive layer formed on a substrate;

a superionic conductor over the first conductive layer

a polymer layer over said superionic conductor;

a layer of mobile ions derived from said superionic conductor and residing between said polymer layer and said superionic conductor; and

a second conductive layer over said polymer layer.

43. (Original) A processor system, comprising:

a processor; and

a memory circuit electrically coupled to said processor, said memory circuit having memory devices comprising:

a first conductive layer formed over a substrate;

a superionic conductive layer over said first conductive layer;

a polymer layer over said superionic conductor;

a layer of mobile ions derived from said superionic conductor and residing between said polymer layer and said superionic conductor; and

a second conductive layer over said polymer layer.

44. (Original) A method of programming a molecular memory cell comprising:

providing a memory cell comprising:

a first conductive layer formed over a substrate;

a superionic conductor over said first conductive layer;

a polymer layer over said superionic conductor;

a layer of mobile ions derived from said superionic conductor and residing between said polymer layer and said superionic conductor; and

a second conductive layer over said polymer layer;

applying a threshold voltage having a first polarity across said first conductive layer and said second conductive layer such that said memory cell is switched from an off state to an on state.

45. (Original) The method of claim 44, wherein applying a threshold voltage further comprises driving said mobile ions into said polymer layer.

46. (Original) The method of claim 44, further comprising the step of applying a threshold voltage having a second polarity across said first conductive layer and said second conductive layer such that said memory cell is switched from an on state to an off state.

47. (Original) A method of reading a memory cell comprising:

providing a memory cell comprising:

a first conductive layer formed over a substrate;

a superionic conductor over said first conductive layer;

a polymer layer over said superionic conductor;

a layer of mobile ions derived from said superionic conductor and residing between said polymer layer and said superionic conductor; and

a second conductive layer over said polymer layer;

applying a voltage less than a threshold voltage across said first conductive layer and said second conductive layer such that the resistance state of the cell can be sensed while not changing the resistance state of the cell.